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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 10/603,322 | 06/26/2003 | Russell K. Myers | LEEE 2 13424 | 3113 |

7590 12/06/2005
FAY, SHARPE, FAGAN, MINNICH & McKEE, LLP
Seventh Floor
1100 Superior Avenue
Cleveland, OH 44114-2579

EXAMINER

SHAW, CLIFFORD C

| | |
|----------|--------------|
| ART UNIT | PAPER NUMBER |
|----------|--------------|

1725

DATE MAILED: 12/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|--------------------------------------|-------------------------------------|--|
| Office Action Summary | Application No. 10/603,322 | Applicant(s) MYERS ET AL. | |
| | Examiner Clifford C. Shaw | Art Unit 1725 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-54,65-76,81-112 and 139-153 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-54,65-76,81-94 and 139-153 is/are allowed.
- 6) ☒ Claim(s) 95,96 and 98-112 is/are rejected.
- 7) ☒ Claim(s) 97 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Detailed Action

1.) The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

2.) Claims 95, 96, and 98-112 are rejected under 35 U.S.C. 103(a) as being unpatentable over Blankenship (5,278,390, cited by applicant) taken with Kiyohara et al. (4,125,759) further taken with the Joseph et al. article ("Electrical Measurements and Heat Input Calculations for the GMAW-P Process", cited by applicant). Figure 8 and the discussion thereof in the patent to Blankenship (5,278,390) disclose an electric arc welder for performing a given weld process with selected waveforms including digital controllers and control based on a digital representation of welding current sensed at 44 and converted to a digital format by element 180. The claims differ from the arrangement of Blankenship (5,278,390) in calling for a particular control algorithm based on the root mean square (RMS) of the welding current. This difference does not patentably distinguish over the prior art. At the time applicant's invention was made, it would have been obvious to have implemented any conventional weld process on the system of Blankenship (5,278,390). In particular, it would have been obvious to have implemented a weld process based on controlling the welding waveform on the basis of an RMS value of sensed current, the motivation being the teachings of Kiyohara et al. (4,125,759) that such is advantageous for controlling a particular type of welding process (see the discussion at columns 9 and 10 and in claim 1 of Kiyohara et al. (4,125,759) wherein a short circuit arc welding process is controlled on the basis of sensing the RMS value of the current during the arcing phase of the

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welding process waveform). It would require only routine skill in the art to incorporate the analog based teachings of Kiyohara et al. (4,125,759) into the digital system of Blankenship (5,278,390). In incorporating these analog teachings into Blankenship (5,278,390), it would have been obvious to have used any convenient algorithm for computing RMS. In particular, it would have been obvious to have used the algorithm taught by the Joseph et al. article, thereby satisfying the claims (see table 1 of the Joseph et al. article wherein applicant's RMS algorithm as set forth in his claims is presented as a formula). In regard to the claimed operational frequencies of the power supply and the claimed sampling frequencies for the sensed current, the same are considered representative of routine and therefore obvious engineering considerations based on the characteristics of the welding waveform desired to be reproduced in the system of the combination. In regard to the claims calling for an event signal at a particular location on the waveform, applicant is to note that the system of Kiyohara et al. (4,125,759) requires an event signal based on the presence or absence of an arc in order to trigger the determination of the RMS signal (this signal is the root mean square of the current over the entire arcing interval). In transferring the analog teachings of Kiyohara et al. (4,125,759) to the digital system of Blankenship (5,278,390), it is considered obvious that an event signal as claimed must be present because the teachings of Kiyohara et al. (4,125,759) require the root mean square is computed over the arcing interval.

3.) Claim 97 is objected to for depending from rejected claims, but would be given favorable consideration if recast in independent form to include all of the limitations of the parent claims. None of the prior art of record teaches or suggests a method with all the steps

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claimed, particularly those steps associated with creating a signal by adding an rms signal and an average signal.

4.) Claims 1-54, 65-76, 81-94, and 139-153 are allowable over the prior art of record.

None of the prior art of record teaches computing rms current over an entire waveform period as set forth in independent claims 1, 65, 84, 141, and 147. None of the prior art of record teaches or suggests the limitations directed to control based both on RMS current and average current as set forth in independent claims 3, 139. None of the prior art of record teaches or suggests the use of two registers in the manner set forth in independent claim 28. The dependent claims are allowable at least because they depend from allowed independent claims.

5.) Applicant's arguments filed 9/26/2005 have been fully considered but they are not persuasive. Applicant argues that the Kiyohara patent does not teach computation of RMS current over an entire welding waveform, but instead only over the arc current portion of the welding waveform, and the claims therefore distinguish over this prior art patent. This argument is persuasive as far as it applies to claims with the limitations directed to computing RMS over the entire welding waveform, and claims 1-54, 65-76, 81-94, and 139-153 have been allowed. However, claims 95, 96, and 98-112 are not limited to computing RMS over the entire welding waveform and are broad enough to be obvious over the prior art as discussed above.

6.) **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

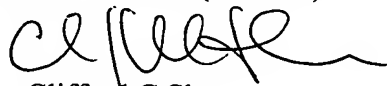
A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication should be directed to Clifford C Shaw at telephone number 571-272-1182. The examiner can normally be reached on Monday through Friday of the first week of the pay period and on Tuesday through Friday of the second week of the pay period.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Thomas G. Dunn, can be reached at 571-272-1171. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Clifford C Shaw
Primary Examiner
Art Unit 1725

December 2, 2005